

# **High resolution IR spectroscopy of plasmas**

Prof. Philip Martin

School of Chemical Engineering and Analytical Science, University of Manchester,  
Philip.martin@manchester.ac.uk

The talk will overview recent research work on low pressure and atmospheric plasmas using high resolution infrared spectroscopy both tunable infrared laser spectroscopy but also Fourier transform infrared absorption and emission spectroscopy. Examples will be given of the application of selective detection methods for studying free radicals and molecular ions in plasmas. The role and spectroscopy of high orbital angular momentum Rydberg states will be presented. For atmospheric pressure non-thermal plasmas (DBD and packed-bed) recent results on CO<sub>2</sub> dissociation, dry reforming and a novel plasma catalysis approach will be presented. Finally, we will show how high resolution IR emission spectroscopy can be used to study a plasma arc source which is employed for surface modification of carbon fibre components.